Pacific Salmon and the Endangered Species Act:

Troublesome Questions

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Introduction

"Should we restore wild salmon to the Pacific Northwest?" is a deceptively simple public policy question that is rarely discussed seriously. Forced to answer with a *yes* or a *no*, either answer is arguably right—and wrong. Moving past such a simple, dichotomous, perfunctory choice raises troublesome questions for both society and individuals.

Society never has, and never will, answer this question unequivocally, nor to the satisfaction of many interested parties. Rather it will be answered indirectly by how we collectively respond to many smaller (but grander), narrower (but broader), more practical (but more philosophical), more immediate (but more long-term), questions such as:

- How expensive and reliable do we want our energy to be?
- Where will we be able to live, how much living space will we be permitted, and what personal choices will we have in deciding?
- How will use of private and public property be prescribed?
- Will the cost of our food continue to be subsidized or will it be subjected to the vagaries of a free market?
- Will we be able to provide high paying, family-wage jobs for this and subsequent generations?
- What personal freedoms or behavioral choices will we compromise or sacrifice, if any, to restore wild salmon?
- Are we willing to substitute hatchery produced salmon for wild salmon, or will we demand that wild salmon runs be restored in spite of the challenge of restoring freshwater habitat to its unaltered state?
- Which individuals and groups, if any, will be granted the right to fish?
- What, if anything, will society do to control the number of humans in general and in the Pacific Northwest in particular?

Answers to these and other questions will determine the future of wild salmon. "Salmon technocrats" are professional fisheries experts who make their living filling gaps in scientific knowledge about salmon, evaluating the consequences of various salmon or management policy options, or implementing whichever policy or management decisions that society selects. Technocrats can help answer these questions, but the salmon "problem" is predominantly and ultimately an issue of societal choice, not scientific adjudication. Society's answer to each question is based partly on the facts produced by the scientific enterprise, but also upon individual preference and moral judgment.

Salmon History

The question of whether or not wild salmon will continue to exist in the western United States is not a new one. The decline started in earnest with the 1849 California gold rush. By the 1850s, excessive harvest and the impacts of min-

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ing activities were decimating salmon in streams surrounding the California Central Valley. In response, by the 1870s the federal government had begun a massive California hatchery program in an unsuccessful attempt to reverse the decline.

By the 1880s, the Columbia salmon runs also were in real trouble. In 1894, the head of the predecessor to the National Marine Fisheries Service proclaimed to Congress that the Columbia's runs were much reduced and still declining. By 1933, the year the first main-stem dam on the Columbia was finished, the total Columbia salmon run already had been reduced to a fifth or less of the pre-1850 level. One can argue that the most severe Columbia River salmon decline took place in the 19th century—not the 20th century—though that is not to imply that the 20th century was a favorable one for salmon.

Restoration Successes

There have been restoration successes for wild salmon, but these occur in locations where salmon spawning and rearing habitat is intact and in good condition, migratory blockages from dams or other obstructions are not present or are minimal, and harvest is strictly controlled at levels that assure that a sufficient number of adults reach the spawning grounds. The sockeye salmon runs of the Fraser River, British Columbia, are the best known example of recovery after decimation. In this case, the cause was a substantial 1914 rock slide that mostly blocked migration. Runs recovered appreciably after fish passage was improved, stringent harvest controls implemented, and other vigorous management actions were taken. The Columbia River had a similar blockage in the 1200s (and probably other times as well) in the Columbia Gorge, east of Portland, Oregon. After the slide was breached naturally, salmon eventually reestablished themselves in the headwater streams without benefit of human involvement. In both cases, freshwater salmon habitat was totally, or at least largely, intact. Presently there are few locations in the Pacific Northwest where pristine spawning and rearing habitat is intact and accessible to salmon.

Abundant Paradoxes

The salmon issue is full of apparent paradoxes. For example, no *species* of Pacific salmon (chinook, coho, sockeye, chum, pink, steelhead, and coastal cutthroat) is in danger of extinction; however, many runs or *stocks* have gone extinct and hundreds more are at risk. North American stocks that spawn in the "north" (northern British Columbia, Yukon, and Alaska) generally are doing well, but most wild stocks that spawn in the "south" (southern British Columbia, Washington, Idaho, Oregon, and California) are not.

No one, not even the most astute salmon scientist knows for certain the relative importance of the various factors that caused the decline of the wild salmon.

The depressed abundance of wild stocks was caused by a well known but poorly understood combination of factors, including unfavorable ocean or climatic conditions; excessive commercial, recreational, and subsistence fishing; various farming and ranching practices; dams built for electricity generation, flood control, and irrigation, as well as many other purposes; water diversions for agricultural, municipal, or commercial requirements; hatchery production to supplement diminished runs or produce salmon for the retail market; degraded spawning and rearing habitat; predation by marine mammals, birds, and other fish species; competition, especially with exotic fish species; diseases and parasites; and many others.

Technocrats continue to vigorously debate what proportion of the decline is attributable to which factor. Many affected agencies, organizations, and entities have developed, or funded the development of, sophisticated assessments or computer models of salmon populations that usually end up—probably not surprisingly—supporting their organization's favored policy position.

The most strident voices include a range of affected groups such as inland barge operators; marine shipping interests; highway users; industries that are dependent on high volumes of electricity; cattlemen's and farmers' associations; logging interests; recreational, commercial, and Indian fishermen; and a spectrum of environmental advocacy organizations. In fact, no one, not even the most astute salmon scientist, knows for certain the relative importance of the various factors that caused the decline of wild salmon, but everyone makes educated guesses.

We also have the recent incongruity of salmon abundance and concern about extinction. Two examples illustrate the point: First, in 1995, more *wild* Pacific salmon (summed over all regions) were harvested than in any other year in history. In such a situation, commercial fishermen typically assert that there is a salmon glut, hence the relatively low prices that they are able to command. Second, in 2001 the total Columbia River salmon run, which are mostly hatchery fish, has been the highest since at least 1938, the year during which the first Federal main-stem Columbia dam was completed.

Try to explain to the average person that salmon are at risk of extinction when

fresh salmon are available at the local grocery store year round at relatively moderate prices. I often attend Oregon State University basketball games where there is a food cart selling "wild salmon burgers" for $4.95. Little wonder that it is difficult to convince many people that salmon extinction is an authentic public policy problem to any but a small, vocal segment of society.

There are explanations that untangle the seeming paradox of salmon abundance concurrent with concern with extinction. Most of the wild fish now come from Alaska and northern British Columbia. They are abundant but this is due predominantly to favorable oceanic conditions, spawning and rearing habitat in a relatively unaltered state, and vigorous regulations to control harvest. Also, large quantities of competitively priced "farm-raised" salmon are available year round from many sources (*e.g.*, Washington, British Colombia, Norway, Scotland, Chile, and New Zealand). And the recent "record" runs in the Columbia are but a shadow of their 1850 level of 10 to 15 million, as well as being predominantly fish of hatchery origin. Although there are explanations, for many people there continues to be the seeming contradiction of salmon abundance simultaneous with cries to confront risks of extinction.

The Endangered Species Act is no less free of paradox and intellectual intrigue. Threatened and endangered salmon are the only listed animals for which government routinely licenses large numbers of people to kill them. Further, if society's concern about loss of salmon stocks in the Pacific Northwest is as great as many people assert, why don't we simply close fishing and hatcheries completely until salmon runs rebound? Recreational, commercial, and Indian fishermen would scream, but most people would not be affected by a ban on fishing or supplementing runs with hatchery fish. Farm-raised salmon would remain abundant and could continue to supply the retail market, and taxpayers would save hundreds of millions of dollars by closing the hatchery system and eliminating the subsidies currently needed to maintain salmon runs.

Effects of Listing

Ultimately, listing wild salmon as endangered or threatened as defined by the Endangered Species Act means that everyone, not just fishermen, is affected. Efforts required to restore wild salmon directly conflict with many other individual and societal priorities. Two of the most obvious and visible recent examples are the ongoing electricity shortfalls and decisions over how to balance Columbia River electricity generation vs. salmon survival, and the contentious lawsuits over how to allocate scarce Klamath Basin water supplies among farmers, refuge managers, threatened salmon, endangered suckers, and threatened bald eagles.

Even if society decides that "saving" salmon is a worthy goal that ought to be accomplished, there is disagreement over what the restoration objective ought to be.

Critics have described the Endangered Species Act as a naive piece of legislation in search of a credible public policy objective. Did Congress really understand what it passed? Most of the discussion at the time, critics argue, involved the sorry state of bald eagles. Were the act's policy implications for salmon comprehended by the senators and congressmen who voted for it? Not likely—one point upon which all agree.

Supporters of the act, on the other hand, maintain that it is forcing society to make the necessary, though painful, decisions for the future well-being of society or, perhaps, even society's very survival. They assert that the act may not be perfect, but it is needed now more than ever, as the salmon decline clearly illustrates. The debate often pivots on moral positions. Although, there may be references to the economic value of salmon fishing, salmon as a Pacific Northwest cultural icon, or salmon being a "surrogate" for overall environmental quality, the fundamental issue, from their perspective at least, is whether or not humans have a right to drive a salmon species or stock to extinction.

Restoration Objectives

Even if society decides that "saving" salmon is a worthy goal that ought to be accomplished, there is disagreement over what the restoration objective ought to be. For example, should the target be simply to save a species, an evolutionarily significant unit, or a stock from extinction? Such a policy objective (*e.g.*, saving a species, evolutionary unit, or stock) can be achieved with relatively low run sizes. However, such runs would not be at levels that would permit sustainable fishing. Is it acceptable to restore wild salmon to levels too small to permit fishing?

A much more challenging restoration objective would be to restore wild salmon runs to historical levels seen prior to 1850. Almost certainly this objective is not achievable with *wild* salmon unless human impacts are reduced to pre-1850 levels. But does society demand that salmon runs be comprised entirely of wild fish? If restoration is constrained to wild fish, it becomes much more challenging and would be especially difficult to produce enough fish to support significant fishing. If hatchery fish are used, and fishing is permitted, there will continue to

be adverse effects on wild salmon, but what level of adverse effect is acceptable to society? Thus, there is no inherently scientifically correct approach to restoration, but rather a suite of alternatives with "best" largely being a function of which vision of the restoration objective one accepts.

Conclusion

Now let us identify an annoying reality to this discussion. The human population of the Pacific Northwest is growing at an annual rate comparable to those in some third-world countries. For example, applying middle-of-the-road (from my perspective) annual growth rates of the current human population in Oregon, Washington, Idaho, and British Columbia (currently 15 million in total), there will be a population of 60-80 million people by 2100. Given such a probable human population level, you may ask whether or not society is being delusional about the chances of the Endangered Species Act, or anything else, doing much to save wild salmon.

Finally, in western North America, we now expend considerable public and private resources in a frantic attempt to save salmon stocks that are down to a few individuals. Have we reached a point where society soon will conclude that sufficient resources already have been spent in an abortive bid to save *all* wild salmon stocks? Or, are we at the stage of recognizing that society wishes to maintain salmon in the Pacific Northwest, but prefers to do it using hatcheries and other technofixes that may be costly and not certain to succeed, but avoid the major social dislocation of restoring *wild* fish? Or, will society accept the creation of *salmon refuges*, analogous to national parks, that preserve runs of a few stocks in a fully wild state? Or, will society demand that protection and restoration of wild salmon trump all other societal priorities, regardless of individual and collective costs?

These are troublesome questions. Questions that force us to accept that we cannot have it all. Questions that expose our personal battles between emotion and intellect. Questions that force us to acknowledge mutually exclusive policy alternatives. Questions that few of us relish.

Should wild salmon be restored to the Pacific Northwest? Salmon technocrats contribute to the answer, but their role should be confined to the crucial role of assessing the probability of success of various policy options. Rather, the answer to the question, with input from salmon technocrats, must come from *society* through its political institutions. It is delusional to think that society will ever answer the question unequivocally, or to the satisfaction of many interested parties. Rather, individuals, society, and our institutions answer the question indirectly by making personal choices, allocating tax expenditures, and setting bureaucratic priorities on issues in which the fate of wild salmon is only a small, often trivial, component. Thus, it may *appear* that society and its political institutions are unable to act on the salmon restoration issue, but, in fact, they *are* making decisions daily on the importance of maintaining or restoring wild salmon compared to competing societal priorities.

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About the Author:

Dr. Robert T. Lackey, senior fisheries biologist at the U.S. Environmental Protection Agency's research laboratory in Corvallis, Oregon, is also courtesy professor of fisheries science and adjunct professor of political science at Oregon State University. Since his first fisheries job 40 years ago mucking out raceways in a Sierra Nevada trout hatchery, he has dealt with a range of natural resource issues from positions in government and academia. His professional work has involved all areas of natural resource management and he has written 100 scientific and technical journal articles. His current professional focus is providing policy-relevant science to help inform ongoing salmon policy discussions. Dr. Lackey also has long been active in natural resources education, having taught at five North American universities. He continues to regularly teach a graduate course in ecological policy at Oregon State University and was a 1999-2000 Fulbright Scholar at the University of Northern British Columbia. A Canadian by birth, Dr. Lackey holds a Doctor of Philosophy degree in Fisheries and Wildlife Science from Colorado State University, where he was selected as the 2001 Honored Alumnus from the College of Natural Resources. He is a Certified Fisheries Scientist and a Fellow in the American Institute of Fishery Research Biologists.